Raytheon

Integrated Terminal Weather System (ITWS)

Final
Site Survey Report (SSR) - FAATC Atlantic City, NJ

Contract No. DTFA01-97-C-00006

24 March 1999

Prepared for

Federal Aviation Administration
Weather Processing Branch
400 7th Street, SW
Washington, DC 20590

Prepared by

Raytheon Systems Company
Training and Services Segment
1001 Boston Post Road
Marlborough, MA 01752

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Executive Summary

Commencing on November 30, 1998 through the 1st of December, Raytheon performed a site survey for the installation of an Integrated Terminal Weather System (ITWS) and associated laboratory terminals within the William J. Hughes FAA Technical Center (FAATC), Atlantic City, New Jersey. The FAATC is in the process of relocating and expanding the ITWS laboratory. The objective of the site survey was to determine equipment layouts, cable lengths, demarcation points, site preparation requirements, and discuss the schedule for installation of the ITWS equipment. Aided by ITWS lab personnel, Raytheon was successful in collecting most of the required data.

The FAATC is to be configured as a "D10" site, that is, as a simulation of the Dallas/Fort Worth configuration. As such the lab will be receiving One (1) ITWS product generator with associated communication devices and Seven (7) situation displays. In addition the FAATC lab is scheduled to receive a National Weather Service Filter Unit (NFU) and an ITWS test tool. Unique to the technical center is the provision of eight (8) ribbon display terminals (RBDTs).

FAATC personnel have developed a proposed lab layout. Since this is not an operational facility controlling aircraft activities, the new equipment being provided is replacing no existing equipment. A standard ITWS equipment rack will be provided and new, modular desks and shelves are being installed by the FAA to accommodate the various ITWS displays.

Sufficient electric capacity exists at the technical center to accommodate this lab. During the installation of new wall layout and furniture FAATC crews will provide all required electrical outlets under the raised floor. Grounding will be to the existing building grounding grid. The number and extent of input and output connections for the lab equipment have not yet been determined. FAA personnel assumed that all external interfaces will be made via telco connection and the proposed telco demarcation point was located.

Installations of new SDs and the test tool will be fairly academic in that the proposed target locations are new open design consoles. These consoles, although not yet installed, are found throughout the FAATC facility and allow easy hardware access and maneuvering room. A raised floor exists throughout the technical center building and provides ample cableway paths to the demarcation point and any other points which may be determined to be necessary.

Raytheon will use the data collected during the site survey to prepare the Site Requirements and Installation Plan (SRIP, CDRL A15003), and the Site Installation Drawings (CDRL A15004) which detail the installation plan for the FAATC ITWS. The SRIP and associated drawings will be completed following FAA review of this SSR and approval of the Final SSR.

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APPENDIXES

TABLES

1. INTRODUCTION

1.1 PURPOSE

This ITWS Site Survey Report for the FAATC has been prepared for the relevant FAA and Raytheon audience concerned with ITWS installations. The SSR documents Raytheon's findings, conclusions and recommendations for the planning and implementation of ITWS within the referenced site. The site survey was conducted in accordance with the ITWS Contract DTFA01-97-C-00006 and program milestones requirements, specifically Contract Data Requirement List (CDRL) A15002 Site Survey Reporting (SSR). This site survey report is prepared in accordance with Data Item Description (DI–MISC–81381), detailing specific site survey reporting requirements.

1.2 LOCATIONS

The following locations were visited during the FAATC site survey:

FAATC ITWS laboratory, demarcation points and cableways

1.3 DATES OF SURVEY

This site survey was conducted on December 1, 1998.

1.4 PERSONNEL INVOLVED IN SITE SURVEY

The site survey was conducted by Raytheon. FAA personnel were present to provide information and answer questions. Raytheon and FAA personnel involved in the site survey are listed below.

Name	Organization
Tom Murphy	Raytheon
Tom Weiss	ACT-320
Hiram Escabi	AUA-460/WX-TAC

Name	Organization
Donne Wedge	ACT-320/BCI
Anthony Rodriguez	ACT-411
Bill Smith	AUA-460/Marconi

1.5 ITWS SITE SURVEY SCHEDULE

The schedule shown below reflects the current site survey reporting and Site Requirements and Installation Plan (SRIP) development CDRL milestone time periods for the FAATC:

Site Survey Report (Preliminary)	30 days after survey completed
Government Review	30 days
Site Survey Report (Final)	30 days after receipt of Government comments
Site Preparation Requirements and Installation Plan (Prelim.)	30 days after final Site Survey Report
Site Installation Drawings (Prelim.)	30 days after final Site Survey Report
Government Review	30 days
Site Preparation Requirements and Installation Plan (Final)	30 days after receipt of Government comments
Site Installation Drawings (Final)	30 days after receipt of Government comments

2. RESULTS

Section two of this SSR is a compilation of all data collected during the course of the FAATC site survey. The majority of data was acquired through interviews with local personnel, FAA provided drawings and documentation, and visual inspection of each installation location, transcribed into a standardized Site Survey Document (SSD) form utilized by Raytheon personnel as a guide tool for data collection.

This section identifies the findings and details of the site survey by location and areas of interest. Section 3 identifies the conclusions and recommendations including any open action items to be addressed.

2.1 FAATC

2.1.1 Summary

The William J. Hughes FAA technical center is a testing and system development facility. Laboratories exist for most computerized systems being utilized by the FAA air traffic control throughout the world. The laboratory currently being used to test and evaluate the ITWS is located on the second floor of the main technical building. The new ITWS laboratory will also be located on the second floor of this building in an area being reconfigured for this purpose. This new area was investigated for the site survey. Plans show that there will be ample room for all equipment to be delivered and installed under this contract.

2.1.2 Access and Security

For access to the FAATC grounds visitors must present a current, picture ID and receive a visitor's parking card to be displayed on the dashboard. At the main desk in the lobby of the building visiting contractors are required to sign in daily for all access on site. The Point Of Contact (POC) for facility access and security clearance is Tom Weiss, ACT-320, Telephone # (609) 485-6898.

2.1.2.1 Badges and Key Cards

Badges for access to this facility may be made available to the installation personnel. If badges are not issued, local ITWS lab personnel will provide access for the installation team during the period(s) Raytheon is on site. Contractor personnel will be escorted by the Technical Officer's Representative (TOR), identified for this facility as: Tom Weiss, ACT-320, Telephone # (609) 485-6898 or alternate TOR (ATOR) as designated.

2.1.2.2 Parking

Ample visitors' parking is available for use. Caution must be used not to park in assigned or special areas as vehicles will be towed at owners' expense.

2.1.2.3 Delivery and Storage

There is a loading dock located on the side of the facility and arrangements for its use require advance coordination with the building facilities personnel. Standard light duty freight dolly and/or hand truck

exist, and are available for use upon request. There is an elevator in close proximity to the loading dock area.

The area in and around the location of the ITWS lab is more than adequate to store all equipment while installation is underway.

2.1.2.4 Operational Considerations

The FAATC operates on a standard eight hour workday. Although the building is open 24 hours a day, it is expected that ITWS installation will conform to the ITWS lab personnel work schedule. If necessary an extended workday can be arranged. Since this facility is not directly involved in air traffic control, there are no operational considerations associated with this installation.

2.1.3 FAATC Laboratory General Facility

2.1.3.1 Construction

No construction, alterations or building modifications are necessary for any building area associated with this ITWS installation.

2.1.3.2 Space Conditions

The new lab facility being developed has been designed to accommodate all ITWS equipment scheduled to be delivered.

2.1.3.3 Environmental Considerations

The specific facility environmental officer had not been identified at the time of this initial survey nor was a facility HAZMAT report available. Local site personnel assisting with the survey indicated that there are no hazardous materials requiring HAZMAT consideration in the areas to be effected by ITWS installation. Environmental informational items will be requested as an action item delivery.

2.1.3.4 Heating /Ventilating /Air Conditioning (HVAC)

Due to the minimal HVAC impact generated by ITWS hardware, current facility capabilities appear to be sufficient to support full ITWS system operation.

2.1.4 ITWS Lab Equipment Placement and Electrical Power

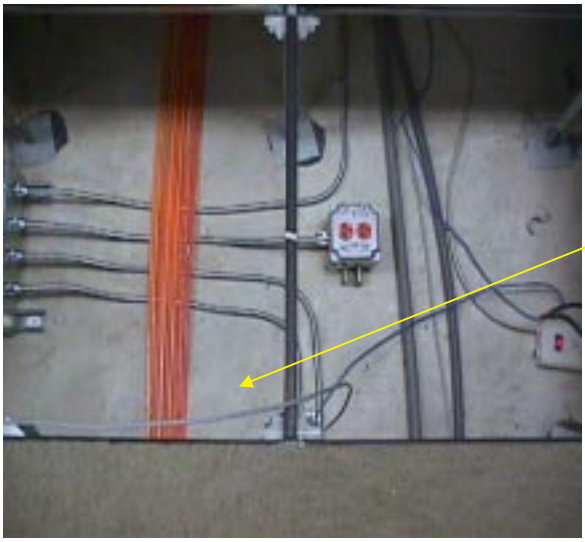
2.1.4.1 New Lab Area

The new location of the ITWS lab is in the vicinity of the intersection of column row “C” and column row “19”. There are permanent walls located at column rows “B” and “18” and the lab limits may extend to one or the other of these walls. Although the lab layout was provided at the survey, its placement on the building floor was not indicated. Technical center personnel indicated that these plans would be made available. As previously stated, the lab has been sized to accommodate the equipment scheduled for delivery.

Several electrical panels are located along the permanent walls in close proximity to the lab location. Electrical conduits and outlets exist under the raised floor and center personnel during the actual construction of the lab will accomplish any reconfiguration of these outlets. No additional electrical

work is anticipated to be necessary to accomplish complete installation of the ITWS equipment.

All communication interface cables will be run under the raised floor. The flexible layout required by the various labs at this facility is not conducive to the use of rigid cable trays. All cables must be plenum rated and may be fixed to the raised floor stantions. Cables under the floor should be run parallel to column rows with ninety degree turns rather than being placed diagonally.



Typical under-floor arrangement of power and communication cables.

The main telco demarcation point, expected to be utilized for ITWS connectivity, is located at column “F21”. All columns are two feet square and located thirty feet on center. Once the exact location of the lab is determined, cable lengths will be easily calculated.

Telco demarcation M1FC @ Column F21

2.1.4.2 Facility Grounding

ITWS has only one grounding requirement, that being the equipment rack itself. The rack will be grounded to the Technical Center grounding grid.

2.1.4.3 Telecommunications Demarcations

ITWS requirements for system interfacing to sensor devices are shown below in table 2-1. This matrix

identifies the current status of these links as surveyed.

Table 2-1 Signal Demarcations

Designator	Rate	Comm Standard	Defined	To be defined	Demarcation Point
NADIN	128kb	EIA530	✔		
ASR-9 #1	9600	EIA530	✔		M1FC @ F21
ASR-9 #2	9600	EIA530	✔		M1FC @ F21
NEXRAD	14.4	EIA530	✔		M1FC @ F21
TDWR	Ethernet	RJ45	✔		M1FC @ F21
LLWAS				✔	

2.1.5 Drawings and Documents Received

The drawings and documents received from the government are listed in Appendix B, FAATC Government Furnished Information (GFI) Drawings and Documents. Additional plans will be supplied prior to completion of the final version of this report.

3. CONCLUSIONS AND RECOMMENDATIONS

3.1 GENERAL SUMMARY

Based on the initial observations and evaluation of survey results, installation of ITWS equipment within the FAATC facility should be relatively straightforward, posing little difficulty. Final confirmation of the type of communication interfaces is necessary in order to perform material planning and purchases. The location of the NADIN demarcation point is necessary to determine required cable lengths.

3.2 SCHEDULE

The program installation schedule deliveries were discussed during the entrance and out briefings. Key milestones and installation dates for the FAATC ITWS system will be provided in the SRIP.

3.3 FAATC ITWS LAB

3.3.1 Summary

One ITWS equipment track will be installed within the ITWS lab and interfaced via Raytheon provided cabling to the FAA demarcation points and directly to installed ITWS displays. The equipment rack will include a NFU, which will accept data from the National Weather Service (NWS) via the NADIN as well as input from the ITWS Test Tool. The ITWS Test Tool will be installed within the lab area on desks and/or racks provided by the technical Center for this purpose.

3.4 ACCESS AND SECURITY

Raytheon personnel will be required to sign in daily for all on site work unless facility decides to issue them temporary badges. All access to the technical Center facility will be via the front lobby area. Raytheon personnel will have to be escorted while working in the facility. Raytheon has been advised to provide advance notification and data for all personnel scheduled to visit this site. General identification and Social Security Number (SSN) information are to be provided in advance by Raytheon.

3.4.1.1 Badges and Key Cards

FAA badges for Raytheon personnel and/or key cards may be provided to facilitate ease of movement within the facility. Contractor personnel will be escorted by the Technical Officer's Representative (TOR) or the designated alternate.

3.4.1.2 Parking

Government parking is available for Raytheon personnel ample visitor parking exists and will be utilized. NO parking will be allowed in areas marked for specific vehicles.

3.4.1.3 Delivery, Storage and Disposal

There is a loading dock located on the side of the facility. Arrangements for its use will be made in advance with the FAATC Facility Manager. Floor protection is advisable when moving equipment and/or pallets within the facility. There is FAA dolly/ hand truck available for use by Raytheon personnel should it be needed and there is an elevator suitable for moving the equipment between floors in close proximity to the loading dock.

The area designated for the ITWS lab is sufficiently large to accommodate all equipment to be installed. Working space in and around the lab area will allow equipment to be stored, uncrated, and assembled at one location.

Raytheon will utilize existing disposal dumpsites or trash bins at the facility during ITWS installation. All items for disposal will be properly marked as "TRASH" before being placed in local containers.

3.4.2 General Facility

3.4.2.1 Operational Considerations

All work performed in the technical Center will be completed during normal daytime working hours of the facility. If longer workdays are desired arrangements may be made with the ITWS lab personnel at the time of installation.

3.4.2.2 Construction

No construction, alterations or building modifications are necessary for any spaces associated with this ITWS installation. However, site preparation may require drilling bolt holes through several data floor

tiles allowing anchoring the ITWS equipment rack.

3.4.2.3 Space Conditions

No relevant problems exist at this time concerning space allocation or availability.

3.4.2.4 Environmental

Local site personnel assisting with the survey indicated that no hazardous materials, requiring HAZMAT consideration exist within the ITWS installation area. A HAZMAT report for the facility will be requested from the FAA to specifically identify any such conditions and identity of the responsible officer.

Procedures addressing unexpected encounters with hazardous materials will be included in the SRIP document.

3.4.2.5 Heating /Ventilating /Air Conditioning (HVAC)

The HVAC capacity will be more than adequate to accommodate the ITWS rack/processor equipment, the SDs, and the Test Tool. Accurate values for thermal output will be incorporated into the SRIP when issued.

3.4.3 Equipment Placement and Electrical Power

3.4.3.1 ITWS Lab

The location selected for the ITWS equipment as noted, is suitable for system installation. The rack will sit directly on the data floor and will be lag bolted from the four corners of the base though the floor, braced with lengths of unistrut. A clearance of six inches or greater will be allocated for positioning adjacent to other equipment for ventilation purposes. Interconnection cabling will be routed to and from the equipment rack under the raised floor.

No electrical work is anticipated to be performed for this installation. It is expected that Technical Center personnel will perform any modifications to the electrical system during the lab construction.

3.4.4 Facility Grounding

The ITWS equipment rack will be grounded directly to the Technical Center grounding grid.

3.4.5 Cableways

Plenum rated cables will be utilized for all ITWS connections. Cables will be located under the existing raised flooring and will be installed in accordance with Technical Center requirements. Cabling paths have been inspected and will be plotted on FAA provided facility drawings and depicted on the appropriate sheets of the Raytheon drawing package.

3.4.6 Demarcation, Cables Routing and Distances

FAA segments directly concerned with telecommunication are to further study the site requirements to

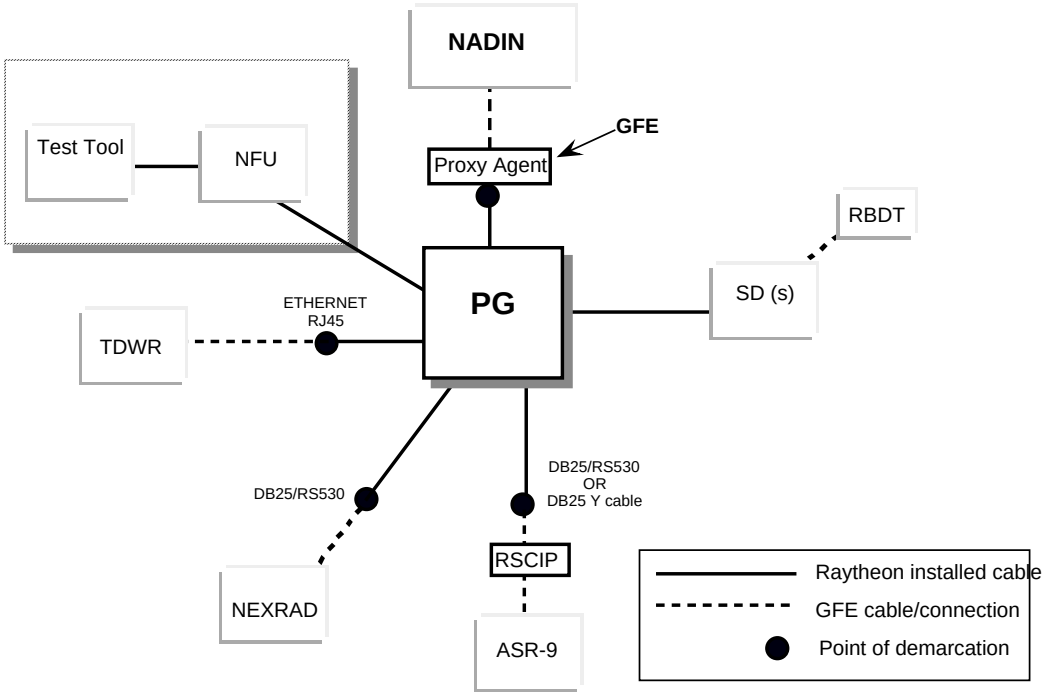
fully integrate ITWS links prior to the start of installations. Raytheon has identified specific points of demarcation based on signal type and specification. Raytheon will provide interconnection cable for each link as required.

3.4.7 Action Items

Action Items were identified during the site survey visit and data collection phase of the site survey. There were 2 action items identified for the FAATC (see Appendix C, Action Items).

Appendix A FAATC ITWS CONFIGURATION

SYSTEM DIAGRAM



FAATC ITWS CONFIGURATION

Table A-1 FAATC ITWS Equipment Configuration List

Equipment	Planned Quantity		Total Quantity	Location
Tracon Equipment				
ITWS Product Generator / Rack	1		1	
Nat. Weather Service Filter Unit (NFU)	1		1	
Situation Displays (SDs)	7		7	
Ribbon Displays (RBDTs)	GFE		0	
Other: (list)			-	
Test Tool	1		1	

All equipment to be installed in the ITWS lab area

Note 1 Planned SD quantity is as indicated in current Section J-19, Display Configuration List, of the ITWS Contract.

FAATC ITWS CONFIGURATION

Table A-2 Height, Width, Depth, and Weight Characteristics

Equipment Description	Height (in.)	Width (in.)	Depth (in.)	Weight (lb.)
Situation Display (SD)	48	30	44	630
Keyboard	2	17	8	TBD
Trackball	3	4.75	9	TBD
ITWS Rack & Equipment	78	22.5	31.5	1,153
UPS				

Table A-3 Electrical/Breaker Requirements

Equipment	Voltage	# of Circuits Recommended	Breaker Size (Amps)	Panel Designated	# of Equip
ITWS	**(AC)**	**Per Equip.**			
ITWS Rack	120	1[1]	20	TBD	1
Situation Display	120	1	15	TBD	7

Equipment	Voltage	# of Circuits Recommended	Breaker Size (Amps)	Panel Designated	# of Equip
Test Tool	**(AC)**	**Per Equip.**			
Processor	120	1	20	TBD	1
Situation Display	120	1	15	TBD	?

Note 1: Each rack houses one convenience outlet for all devices.

APPENDIX B FAATC Government Furnished Information (Gfi) Drawings And Documents

Table B-1 FAATC Drawings and Documents

Document Number	Date	Description	Date Hard Copy Obtained	Date Soft Copy Obtained
None	None	ITWS Lab Equipment Layout		

Appendix C ACTION ITEMS

Table C-1 Action Items

	Assigned	Action Item
1.	FAA	Provide facility drawings showing location of ITWS lab.
2.	FAA	Provide location of NADIN demarcation point.
3.	FAA	Provide Environmental/Hazardous Materials report for the facility.

Appendix D ACRONYMS

ITWS GENERAL ACRONYMS LIST

AF	Airway Facilities
AMIC	Air Traffic Area Manager in Charge
AOS	Operational Support Service
ARSR	Air Route Surveillance Radar
ARTCC	Air Route Traffic Control Center
ARTS	Automated Radar Terminal System
ASR	Airport Surveillance Radar
AT	Air Traffic
ATC	Air Traffic Control
ATCT	Air Traffic Control Tower
ATOR	Alternate Technical Officer's Representative
ATSS	Air Traffic Systems Specialist
AWG	American Wire Gauge
CAC	Contract Award Configuration
CAI	Contractor Acceptance Inspection
CAT&E	Contractor Acceptance Test and Evaluation
CDRL	Contract Data Requirements List
CFE	Contractor Furnished Equipment
CO	Contracting Officer
COMM	Communications Rack (ITWS)
COTS	Commercial off the shelf
DDM	Digital Display Monitor
DID	Data Item Description
F&E	Facilities and Equipment
FAA	Federal Aviation Administration
FAATC	FAA Technical Center
FSS	Flight Service Station
GFE	Government Furnished Equipment
GFI	Government Furnished Information
HAZMAT	Hazardous Material
HIA	Host Interface Adapter
HVAC	Heating, Ventilation, and Air Conditioning
HW, H/W	Hardware
IC&A	Installation, Checkout, and Acceptance
IFR	Instrument Flight Rules
ILS	Integrated Logistics Support
INCO	Installation and Checkout
IOC	Initial Operational Capability
IPT	Integrated Product Team
JAI	Joint Acceptance Inspection
LAN	Local Area Network

LRU	Lowest Repairable Unit
MIPR	Master Installation Program Record
MSAW	Minimum Safe Altitude Warning
MPG	Multi-Point Ground
NAS	National Airspace System
NEC	National Electrical Code
NOAA	National Oceanic and Atmospheric Administration
OCC	Operations Control Center
OCD	Operational Capability Demonstration
OCT	Operational Capability Test
OPS	Operations
ORD	Operational Readiness Demonstration
O/S	Operating System
OSF	Operational Support Facility
OT&E	Operational Test and Evaluation
PC	Personal Computer
PCU	Power Conditioning Unit
PG	Product Generator
POC	Point of Contact
PT	Product Team
PTL	Product Team Lead
PTR	Program Trouble Report
QA	Quality Assurance
QRO	Quality Reliability Officer
R	Router
RAPM	Regional Associate Program Manager
RES	Raytheon Electronic Systems
RMC	Regional Material Center
RSC	Raytheon Service Company
SAT	Site Acceptance Test
SCIP	Serial Communications Interface Processor
SD	Situation Display
SIA	Site Implementation Agreement
SIM	Test and Training Simulator (ITWS)
SIR	Site Implementation Review
SPRIP	Site Preparation Requirements and Installation Plan
SRG	Signal Reference Ground
SSD	Site Survey Document
SSR	Site Survey Report
SRIP	Site Requirements and Installation Plan
STAP	Site Transition and Activation Plan
ITWS	Integrated Terminal Weather System
SW, S/W	Software
TMU	Traffic Management Unit
TOR	Technical Officer’s Representative

Tracon	Terminal Radar Approach Control
TWR	Tower
VFR	Visual Flight Rules

Appendix E CABLE DATA MATRIX

Table E-1 Cable Demarcation Matrix

Designator	Comm Standard	Demarcation Point A	Estimated Distance	Demarcation Point B